

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 Claim 1 (original): A method for producing a high resolution detector array,
2 said method comprising the steps:
3 cutting a first selected number of bars of scintillator material to a selected
4 dimension;
5 polishing said selected number of bars;
6 coating said polished bars with an adhesive of a selected index of refraction;
7 laminating said polished bars together, wherein a thin reflective optical film
8 is disposed between adjoining scintillator bars, wherein said optical film defines a
9 reflector, whereby an assembly of laminated bars having a layer of said optical film
10 between adjoining bars is formed;
11 allowing said laminated assembly to cure;
12 cutting a second group of said selected number of bars from said laminated
13 assembly, wherein said cut is perpendicular to said polished bars, whereby each of
14 said second group of cut bars comprises a laminated composite of said selected
15 number of scintillator elements having a reflector interposed between adjoining
16 scintillator crystals;
17 polishing said second group of said cut bars;
18 coating said second group of polished bars with said adhesive of said
19 selected index of refraction;
20 laminating a second selected number of said second group of polished bars
21 together, wherein a thin reflective optical film is disposed between adjoining
22 scintillator bars, wherein said thin optical film defines a reflector, whereby a
23 detector array of discrete scintillator crystals having a reflector disposed between
24 adjoining discrete scintillator elements is formed.

1 Claim 2 (original): The method of claim 1 wherein each of said selected
2 number of bars is cut from a single scintillator material.

1 Claim 3 (original): The method of claim 1 wherein said first selected number
2 of bars is equal to said second selected number of said second group of polished
3 bars.

1 Claim 4 (original): The method of claim 2 wherein said single scintillator
2 material comprises a first layer having a first selected decay time optically bonded
3 to a second layer having a second selected decay time.

1 Claim 5 (original): The method of claim 1 wherein a first half of said first
2 selected number of bars are cut from a scintillator material of a first selected decay
3 time, and further wherein a second half of said first selected number of bars are
4 cut from a scintillator material of a second selected decay time.

1 Claim 6 (original): The method of claim 1 wherein a first half of said first
2 selected number of bars are cut from a first scintillator material comprising a first
3 layer having a first selected decay time optically bonded to a second layer having a
4 second selected decay time, and further wherein a second half of said first selected
5 number of bars are cut from a second scintillator material comprising a first layer
6 having a first selected decay time optically bonded to a second layer having a
7 second selected decay time.

1 Claim 7 (original): The method of claim 1 wherein said steps of polishing are
2 carried out by chemically etching said selected number of bars.

1 Claim 8 (original): The method of claim 1 wherein said steps of polishing are
2 carried out by mechanical polishing.

1 Claim 9 (original): The method of Claim 1 wherein said adhesive of a
2 selected index of refraction is selected from a group consisting of epoxies, silicon
3 based adhesives and silicon based encapsulants.

1 Claim 10 (original): The method of claim 1 wherein said adhesive is selected
2 from a group consisting of Epotek 301-2, Sylgard 186, Sylgard 184, GE 656 and
3 GE 615.

1 Claim 11 (original): The method of claim 5 wherein said step of laminating
2 said polished bars together is carried out such that a bar of said scintillator of said
3 first selected decay time adjoins a bar of scintillator material of said second decay
4 time whereby bars of different decay times are laminated together in an alternating
5 pattern.

1 Claim 12 (original): The method of claim 1 wherein said optical film is
2 loaded with a reflective material selected from a group consisting of BaSO₄, MgO,
3 SiO₂, powdered Teflon, CaCO₃ and TiO₂.

1 Claim 13 (original): The method of claim 11 wherein said step of laminating
2 said second group of polished bars together is carried out such that a
3 checkerboard pattern of alternating scintillation crystals of different decay times is
4 formed.

1 Claim 14 (original): The method of claim 1 wherein said optical film is a
2 mono-layer film.

1 Claim 15 (original): The method of claim 1 wherein said optical film is a
2 multi-layer film.

1 Claim 16 (original): The method of claim 1 wherein said optical film is
2 selected from a group consisting of polyester film and polyethylene film.

1 Claim 17 (original): A method for producing a high resolution detector
2 array, said method comprising the steps:
3 cutting a first selected number of bars of scintillator material to a selected
4 dimension, wherein a first half of said selected number of bars are cut from a
5 scintillator material of a first selected decay time, and further wherein a second
6 half of said selected number of bars are cut from a scintillator material of a second
7 selected decay time;
8 polishing said selected number of bars;
9 coating said polished bars with an adhesive of a selected index of refraction;
10 laminating said polished bars together such that a bar of said scintillator of
11 said first selected decay time adjoins a bar of scintillator material of said second
12 decay time whereby bars of different decay times are laminated together in an
13 alternating pattern, wherein a thin polyethylene optical film is disposed between
14 adjoining scintillator bars, wherein said optical film defines a reflector, whereby an
15 assembly of laminated bars having a layer of said optical film between adjoining
16 bars is formed;
17 allowing said laminated assembly to cure;
18 cutting a second group of said selected number of bars from said laminated
19 assembly, wherein said cut is perpendicular to said polished bars, whereby each of
20 said second group of cut bars comprises a laminated composite of said selected
21 number of scintillator elements having a reflector interposed between adjoining
22 scintillator crystals;
23 polishing said second group of said cut bars;
24 coating said second group of polished bars with said adhesive of said
25 selected index of refraction;
26 laminating a second selected number of said second group of polished bars
27 together, wherein a thin polyethylene film is disposed between adjoining scintillator
28 bars, wherein said thin optical film defines a reflector, wherein said step of
29 laminating said second group of polished bars together is carried out such that a
30 checkerboard pattern of alternating scintillation crystals of different decay times is

31 formed, whereby a detector array of discrete scintillator crystals having a reflector
32 disposed between adjoining discrete scintillator elements is formed.

1 Claim 18 (original): The method of claim 17 wherein said first selected
2 number of bars is equal to said second selected number of said second group of
3 polished bars.

1 Claim 19 (original): The method of claim 17 wherein said single scintillator
2 material comprises a first layer having a first selected decay time optically bonded
3 to a second layer having a second selected decay time.

1 Claim 20 (original): The method of claim 17 wherein a first half of said first
2 selected number of bars are cut from a first scintillator material comprising a first
3 layer having a first selected decay time optically bonded to a second layer having a
4 second selected decay time, and further wherein a second half of said first selected
5 number of bars are cut from a second scintillator material comprising a first layer
6 having a first selected decay time optically bonded to a second layer having a
7 second selected decay time.

1 Claim 21 (original): The method of claim 17 wherein said steps of polishing
2 are carried out by chemically etching said selected number of bars.

1 Claim 22 (original): The method of claim 17 wherein said steps of polishing
2 are carried out by mechanical polishing.

3 Claim 23 (original): The method of Claim 17 wherein said adhesive of a
4 selected index of refraction is selected from a group consisting of epoxies, silicon
5 based adhesives and silicon based encapsulants.

1 Claim 24 (original): The method of claim 17 wherein said adhesive is
2 selected from a group consisting of Epotek 301-2, Sylgard 186, Sylgard 184, GE
3 656 and GE 615.

- 1 Claim 25 (original): The method of claim 17 wherein said optical film is
- 2 loaded with a reflective material selected from a group consisting of BaSO₄, MgO,
- 3 SiO₂, powdered Teflon, CaCO₃ and TiO₂.